ROSEMARY
FOR HOMOEOPATHIC PREPARATIONS

ROSMARINUS OFFICINALIS
FOR HOMOEOPATHIC PREPARATIONS

Rosmarinus officinalis ad praeparationes homoeopathicas

DEFINITION

Fresh flowering branches of *Rosmarinus* officinalis L.

CHARACTERS

Macroscopic and microscopic characters described under identification tests A and B.

Characteristic aromatic odour.

IDENTIFICATION

A. Both the woody stem and branches of rosemary are sub-cylindrical. The leaves are revolute, opposite, sessile, linear, persistent and coriaceous ; the adaxial surface is dark green, glabrous and granular ; the white, tomentose abaxial surface is marked by a prominent midrib. The spicular inflorescence bears subsessile flowers in all seasons. The pubescent, gamosepalous, bilabiate, bell-shaped calyx has only three lobes. The gamopetalous, bilabiate, long-tubed corolla has an upper lip in the form of a 2-lobed helmet and a 3-lobed lower lip ; the middle lobe being concave and much wider. The corolla is pale blue, white or whitish, and spotted with small purple dots on the inside. The androecium consists of only two stamens ; the anthers are elongated and have a single loculus opening by means of a single slit.

B. Examine a fragment of epidermis from the underside of the leaf under a microscope, using *chloral hydrate solution R.* The sinuous-celled epidermis is characterised by the presence of stomata, always accompanied by two subsidiary cells, ramified multi-cellular trichomes and 8-celled glandular trichomes.

TESTS

Foreign matter (*2.8.2*): maximum 5 per cent.

Loss on drying *(2.2.32) :* minimum 45.0 per cent, determined on 5.0 g of finely-cut drug, by drying in an oven at 100-105 °C for 2h.

STOCK

DEFINITION

Rosemary mother tincture complies with the requirements of the general technique for the preparation of mother tinctures (see *Homoeopathic* Preparations *(1038)* and French Pharmacopoeia Authority Supplement). The mother tincture is prepared with ethanol (65 per cent *V/V*), using the fresh flowering branches of *Rosmarinus* officinalis L.

The General Chapters and General Monographs of the European Pharmacopoeia and Preamble of the French Pharmacopoeia apply.

Content : minimum 0.05 per cent *m/m* of total hydroxycinnamic derivatives, expressed as rosmarinic acid ($C_{18}H_{18}O_8$; M_r 360).

CHARACTERS

Appearance: reddish-brown liquid.

Characteristic odour.

IDENTIFICATION

A. Thin-layer chromatography (2.2.27).

Test solution. Mother tincture.

Reference solution. Dissolve 10 mg of *rosmarinic acid R* and 10 mg of *luteolin R* in 10 mL of *ethanol (96 per cent) R.*

Plate : TLC silica gel plate R.

Mobile phase : anhydrous formic acid R, ethyl formiate R, toluene R (10:40:50 *V/V/V*).

Application : 20 mL of test solution, 10 mL of reference solution, as bands.

Development : over a path of 10 cm.

Drying : in air.

Detection : first spray with a 10 g/L solution of *diphenylboric acid aminoethyl ester R* in *methanol R,* then with a 50 g/L solution of *macrogol 400 R* in *methanol R.* Allow the plate to dry in air for about 30 min. Examine in ultraviolet light at 365 nm.

Results : see below the sequence of fluorescent zones present in the chromatograms obtained with the reference solution and the test solution. Furthermore other faint fluorescent zones may be present in the chromatogram obtained with the test solution.

Top of the plate	
	A greenish-yellow zone A greenish-yellow zone A greenish-yellow zone
------	------
Luteolin : a yellow zone	A yellow zone (luteolin)
------	------
Rosmarinic acid : a greenish-blue zone	A greenish-blue zone (rosmarinic acid)
Reference solution	**Test solution**

The General Chapters and General Monographs of the European Pharmacopoeia and Preamble of the French Pharmacopoeia apply.

B. Thin-layer chromatography (2.2.27).

Test solution. Mother tincture.

Reference solution. Dissolve 10 mg of *betulin R* and 10 mg of *borneol R* in 10 mL of *ethanol (96 per cent) R.*

Plate : TLC silica gel plate R.

Mobile phase : ethyl acetate R, toluene R (15:85 *V/V*).

Application : 20 µL of test solution, 10 µL of reference solution, as bands. Development : over a path of 10 cm.

Drying : in air.

Detection : spray with anisaldehyde solution R and heat to 100-105 °C for 10 min. Examine in daylight. Results : see below the sequence of zones present in the chromatograms obtained with the reference solution and the test solutions. Furthermore other faint zones may be present in the chromatogram obtained with the test solution.

Top of the plate	
------	A faint purplish-grey zone ------
	An orange-pink zone
Borneol : a greenish-blue zone	A faint greenish-blue zone
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Betulin : a purple zone	A purple zone (betulin) A purplish-blue zone
Reference solution	**Test solution**

TESTS

Ethanol *(2.9.10) :* 60 per cent (*V/V*) to 70 per cent (*V/V*).

Dry residue (*2.8.16*): minimum 1.0 per cent *m/m.*

ASSAY

Ultraviolet and visible absorption spectrophotometry *(2.2.25).*

Stock solution. Place 5.00 g of mother tincture in a volumetric flask and dilute to 50.0 mL with *ethanol (50 per cent V/V) R.*

Test solution. In a volumetric flask, place 1.0 mL of stock solution. Add 2 mL of *0.5 M hydrochloric acid,* 2 mL of an extemporaneous solution prepared by dissolving 10 g of *sodium nitrite R* and 10 g of *sodium molybdate R* in 100 mL of *water R,* and 2 mL of *dilute sodium hydroxide solution R.* Dilute to 10.0 mL with *water R* and mix.

Compensation liquid. In a volumetric flask, place 1.0 mL of stock solution, 2 mL of *0.5 M hydrochloric acid,* 2 mL of *dilute sodium hydroxide solution R* and dilute to 10.0 mL with *water R.*

The General Chapters and General Monographs of the European Pharmacopoeia and Preamble of the French Pharmacopoeia apply.

Detection : immediately at 505 nm.

Calculate the percentage content *m/m* of total hydroxycinnamic derivatives, expressed as rosmarinic acid, from the expression :

$$\frac{A \times 1.25}{m}$$

i.e taking the specific absorbance of rosmarinic acid to be 400 at 505 nm.

A = absorbance of the test solution measured at 505 nm,

m = mass of the sample, in grams.

The General Chapters and General Monographs of the European Pharmacopoeia and Preamble of the French Pharmacopoeia apply.